

whilst it is as definitely systematic, has twice the range of the mean lunar-diurnal variation ; and it is also subject to remarkable modifications which accompany changes of phase of the moon.

II. "Note on a possible Ultra-Solar Spectroscopic Phenomenon."

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One great object with the solar-eclipse expeditionists at work to-day in the far East is to trace spectroscopically the existence of any faint solar luminous appendage to a further distance from the sun than the brighter parts of the corona hitherto so identified.

But *much* further they cannot go, on account of the large amount of general atmospheric illumination during every lunar-solar eclipse. The matter may, however, be taken up again during a *terrestrial* solar eclipse, *i. e.* an ordinary sunset below the horizon, if the sun be sufficiently far below to terminate *all* aerial twilight. Under such circumstances, too, it is that the zodiacal light, historically called the sun's atmosphere, is occasionally seen stretching away to distances of 60, 90, and even more degrees from the sun.

Now I have recently been trying to test in this manner an alleged foreign observation of the zodiacal light's spectrum, but in vain. Some sort of faint bluing of the dark night sky there certainly was over the north-western horizon when the sun was more than 18° vertically below, and its spectrum I noted at the time, but only as being that of the very last of the twilight.

Perhaps it was only that ; but perhaps, also, it may have been the direct light of some solar appendage approximating to the outer coronal region ; for, on making up the accompanying plate* of nine observed spectra, and comparing them with a tabular solar spectrum, a wide distance was manifested between the place of maximum light in the solar continuous spectrum, as given by Fraunhofer, or near wave-length 5620, and in my so-called residual twilight spectrum, which was wave-length 5300.

I tested, therefore, lately Fraunhofer's value for the solar spectrum in my own night-apparatus, by darkening its objective to all but extinction with four thicknesses of linen cloth in the middle of a dull, grey day, and found for the last visible portion of continuous spectrum wave-length 5700 nearly ; that is, Fraunhofer's value was confirmed, and my residual-twilight spectrum left anomalous as regards the ordinary solar spectrum, but remarkably agreeable with the corona spectrum, whose chief line has wave-length 5322, and which spectrum has been shown by Mr. Lockyer to decrease its number of lines, and tend to form a faint continuous spectrum, as it thins out with increase of distance from the sun's limb.

* See plate 54, vol. xiii., "Astronomical Observations made at the Royal Observatory, Edinburgh."